

### 1. Amendments to the Claims:

A listing of the entire set of pending claims (including amendments to the claims, if any) is submitted herewith per 37 CFR 1.121. This listing of claims will replace all prior versions, and listings, of claims in the application.

#### **Listing of Claims:**

1. (Currently Amended) A method for the spatially resolved determination of physical, chemical and/or biological properties or state variables, particularly substance concentrations, temperature, pH and/or physical fields, and/or the change in such physical, chemical and/or biological properties or state variables in an examination area of an examination object by determining ~~[[the]]~~ a change in ~~[[the]]~~ spatial distribution and/or ~~[[the]]~~ mobility~~[[,]] particularly the mobility in rotation[[,]]~~ of magnetic particles in ~~[[this]]~~ the examination area or in parts thereof as a function of the effect of physical, chemical and/or biological influencing variables on at least a part-area and/or in the physical, chemical and/or biological conditions in at least a part-area of the examination area, ~~by means of the following steps~~ the method comprising:

a) ~~introducing at least partially covered and/or coated magnetic particles having at least one solid, viscous and/or liquid shell or a coating~~ ~~[[and]]~~ into at least part of the examination area and/or ~~introducing magnetic particles into at least part of the examination area and covering and/or coating at least some of these particles in the examination area,~~

b) generating a magnetic field with a spatial profile of the magnetic field strength such that there is produced in the examination area a first part-area having a low magnetic field strength and a second part-area having a higher magnetic field strength,

c) changing the ~~[[,]] in-particular~~ relative ~~[[,]]~~ spatial position of the ~~[[two]]~~ first and second part-areas in the examination area or changing the magnetic field strength in the first part-area so that the magnetization of the particles is locally changed,

d) detecting signals that depend on ~~[[the]]~~ magnetization in the examination area that is influenced by ~~this-change~~ said changing, and

e) evaluating the signals so as to obtain information about ~~[[the]]~~ change in the spatial distribution and/or mobility of the magnetic particles in the examination area,

wherein the coating is degradable and inhibits mobility of the particles.

2. (Currently Amended) A method as claimed in claim 1, ~~characterized in that step b)~~ wherein said changing takes place before step a) said introducing, or in that steps a) and b) said introducing and said changing are carried out essentially at the same time, and/or in that steps c) to e) said changing, said detecting and said evaluating are repeated at least once.

3. (Currently Amended) A method as claimed in claim 1, ~~characterized in that~~ wherein the examination object is a polymer material ~~[[,]] in-particular a thermoplastic polymer or a polymer blend,~~ a polymer melt, a microorganism, a plant, a plant part, a living thing or a part of a living thing.

4. (Currently Amended) A method as claimed in claim 1, ~~characterized in that the~~  
wherein a degree of mobility of the magnetic particles in the examination area is  
determined continuously or at intervals and is correlated with a state variable or property  
of the examination area, ~~in particular~~ the state variable including a temperature, a  
concentration and/or a viscosity.

5. (Currently Amended) A method as claimed in claim 1, ~~characterized in that the~~  
wherein a degree of mobility of the magnetic particles in a polymer melt that is forming  
or curing is determined continuously or at intervals and is correlated with ~~[[the]]~~ a degree  
of curing or ~~[[the]]~~ a degree of melting of a polymer material~~[[,]]~~ in particular of a  
~~thermoplastic polymer.~~

6. (Currently Amended) A method as claimed in claim 1, ~~characterized in that~~ wherein  
at least some of the magnetic particles have anisotropic properties.

7. (Currently Amended) A method as claimed in claim 1, ~~characterized in that the~~  
wherein an effective anisotropy of the magnetic particles is great enough for ~~[[the]]~~ a  
reversal of the magnetization of the ~~particle~~ magnetic particles to take place by ~~means of~~  
geometric (Brown's) rotation and by ~~means of~~ Neel's rotation.

8. (Currently Amended) A method as claimed in claim 1, ~~characterized in that~~ wherein  
the magnetic ~~particle is a~~ particles are monodomain ~~particle~~ particles, the magnetization

of the monodomain particles ~~[[which]]~~ is reversed by ~~means of~~ Brown's rotation and Neel's rotation.

9. (Currently Amended) A method as claimed in claim 1, ~~characterized in that~~ wherein the magnetic particle is a ~~hard~~ hard-magnetic or soft-magnetic multidomain particle.

10. (Currently Amended) A method as claimed in claim 1, ~~characterized in that~~ wherein the magnetic particles comprise hard-magnetic materials.

11. (Currently Amended) A method as claimed in claim ~~[[1]]~~ 10, ~~characterized in that~~ wherein the hard-magnetic materials comprise Al-Ni, Al-Ni-Co and Fe-Co-V alloys and also barium ferrite ( $\text{BaO} \cdot 6\text{xFe}_2\text{O}_3$ ).

12. (Currently Amended) A method as claimed in claim 1, ~~characterized in that the material for~~ wherein the ~~covering or coating can be degraded or dissolved~~ is degradable thermally, chemically, biochemically, by ~~means of~~ electromagnetic radiation or ultrasound and/or mechanically.

13. (Currently Amended) A method as claimed in claim 1, ~~characterized in that the material for~~ wherein the ~~covering or coating comprises~~ polysaccharides, starch, ~~in particular dextrans or cyclodextrins~~ ~~[[,]]~~ waxes, oils, fats, glycerin, gels or plastics~~[[,]]~~ in particular including thermoplastic polymers or blends thereof.

14. (Currently Amended) A method as claimed in claim 1, ~~characterized in that~~ wherein the coating of at least some of the magnetic particles ~~have a coating or covering~~ consisting consist of at least one protein, polypeptide, antibody and/or organosilane.

15. (Currently Amended) A method as claimed in claim 1, ~~characterized in that the evaluation takes place by means of the following steps~~ wherein said evaluating comprises:

a) selection of a path for ~~[[the]]~~ movement of the first part-area having a low magnetic field strength within the examination area,

b) recording of reference data by ~~means of~~ reference samples along the path according to ~~[[a]]~~ said selection at at least one location~~[[,]] in particular a number of locations[[,]] in the case of at least two[[,]] in particular a number of[[,]] external parameters using at least a first receiving coil,~~

c) interpolation and/or extrapolation of the reference data recorded ~~in b) in respect of during said recording to points and for external parameters not recorded in step b) during said recording,~~

d) measurement of the path within the examination area in a sequence that is identical to that used ~~for the~~ during said recording ~~of data by means of~~ reference samples according to ~~[[b]]~~ said recording via the at least ~~[[a]]~~ first ~~and/or second~~ receiving coil, and

e) comparison of ~~[[the]]~~ data obtained ~~according to d)~~ during said measurement with the reference data ~~according to b)~~ obtained during said recording and/or e), in particular during said interpolation by minimizing the error square.

16. (Currently Amended) A method as claimed in claim 15, ~~characterized in that in a step e')~~ that follows step e) wherein after said interpolation, the reference data obtained in steps b) during said recording and/or [[c)] during said interpolation are converted to ~~[[the]]~~ characteristics of at least a second receiving coil used ~~for the~~ during said measurement in step d).

17. (Currently Amended) A method as claimed in claim 15, ~~characterized in that in a further step f) the~~ wherein data obtained ~~by means of~~ during said comparison ~~in step e)~~ are assigned to a gray value for a pixel to ~~give an image~~ provide images, with ~~[[the]]~~ relative pixel intensity representing ~~[[the]]~~ a degree of the determined external parameters.

18. (Currently Amended) A method as claimed in claim 17, ~~characterized in that in a further step g)~~ wherein the images obtained ~~in step f)~~ are displayed in a merged image.

19. (Currently Amended) A method as claimed in claim 15, ~~characterized in that the~~ wherein a sequence of steps d) and e) said measurement and said comparison is repeated at least once.

Claims 20 - 35. (Canceled).

36. (New) A method as claimed in claim 3, wherein the polymer is a thermoplastic polymer or a polymer blend.

37. (New) A method as claimed in claim 5, wherein the polymer material is a thermoplastic polymer.

38. (New) A method as claimed in claim 13, wherein the starch is a dextrin or a cyclodextrin.

39. (New) A method for the spatially resolved determination of physical, chemical and/or biological properties or state variables, particularly substance concentrations, temperature, pH and/or physical fields, and/or the change in such physical, chemical and/or biological properties or state variables in an examination area of an examination object by determining a change in spatial distribution and/or mobility of magnetic particles in the examination area or in parts thereof as a function of the effect of physical, chemical and/or biological influencing variables on at least a part-area and/or in the physical, chemical and/or biological conditions in at least a part-area of the examination area, the method comprising:

a) introducing at least partially coated magnetic particles having a partial coating into at least part of the examination area,

b) generating a magnetic field with a spatial profile of the magnetic field strength such that there is produced in the examination area a first part-area having a low magnetic field strength and a second part-area having a higher magnetic field strength,

c) changing the relative spatial position of the first and second part-areas in the examination area or changing the magnetic field strength in the first part-area so that the magnetization of the particles is locally changed,

d) detecting signals that depend on magnetization in the examination area that is influenced by said changing, and

e) evaluating the signals so as to obtain information about change in the spatial distribution and/or mobility of the magnetic particles in the examination area,

wherein the partial coating is degradable and inhibits mobility of the particles.

40. (New) A method for the spatially resolved determination of physical, chemical and/or biological properties or state variables, particularly substance concentrations, temperature, pH and/or physical fields, and/or the change in such physical, chemical and/or biological properties or state variables in an examination area of an examination object by determining a change in spatial distribution and/or mobility of magnetic particles in the examination area or in parts thereof as a function of the effect of physical, chemical and/or biological influencing variables on at least a part-area and/or in the physical, chemical and/or biological conditions in at least a part-area of the examination area, the method comprising:



- a) introducing magnetic particles into at least part of the examination area and coating at least some of the particles in the examination area with a coating,
  - b) generating a magnetic field with a spatial profile of the magnetic field strength such that there is produced in the examination area a first part-area having a low magnetic field strength and a second part-area having a higher magnetic field strength,
  - c) changing the relative spatial position of the first and second part-areas in the examination area or changing the magnetic field strength in the first part-area so that the magnetization of the particles is locally changed,
  - d) detecting signals that depend on magnetization in the examination area that is influenced by said changing, and
  - e) evaluating the signals so as to obtain information about change in the spatial distribution and/or mobility of the magnetic particles in the examination area,
- wherein the coating is degradable and inhibits mobility of the particles.